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| EXAMINER |
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SCHECHTER, ANDREW M

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/603,990

Applicant(s)

NAM ET AL.

Examiner

Andrew Schechter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-15 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-15 and 17-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Response to Arguments***

2. The indicated allowability of claims 6, 10, 11, 16, 19, and 20 is withdrawn in view of the newly discovered reference(s). Rejections based on the newly cited reference(s) follow.
3. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

4. Claim 11 is objected to because of the following informalities: Is this claim supposed to depend on claim 9 or claim 10? Clarification and appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 1, 2, 4, 5, 7, 10-12, 14, 15, and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by *Jang et al.*, U.S. Patent No. 6,927,820.

[The applied reference has a common assignee with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.]

[The applied reference has a filing date of 25 June 2003; therefore, it might be possible to overcome this rejection by filing a certified translation of the applicant's priority document in order to perfect the foreign priority date of 31 December 2002.]

*Jang* discloses [see Figs. 7-14, for instance] a transfective LCD comprising a substrate [100] having a reflective portion ["C"] and a transmissive portion ["D"]; a gate line [104] on the substrate, a data line [122] crossing the gate line and defining a pixel region; a thin film transistor [see Fig. 10C] connected to the gate line and the data line; a plurality of uneven patterns consisting of a first organic material layer [M1] within the reflective portion, the uneven patterns partially covering the substrate; a second organic material layer [M2] on the first organic material layer, the second organic material layer having an open portion at the transmissive portion [see Fig. 11F], a reflective layer [126]

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on the second organic material layer having a transmissive hole at the open portion [see Fig. 11F], and a pixel electrode [132] on the reflective layer. Claim 1 is therefore anticipated.

Considering the additional limitations of claim 10, *Jang* also discloses a common electrode on an inner surface of a second substrate, with liquid crystal between the pixel electrode and the common electrode, where in the pixel electrode and the common electrode are separated by a first cell gap [2d] in the transmissive portion, and a second cell gap [d] in the reflective portion, and the first cell gap is twice greater than the second cell gap [see Fig. 13, for instance]. Claim 10 is therefore anticipated as well.

Considering the additional limitations of claim 12, *Jang* also discloses the method of fabricating the above LCD, comprising performing an exposure and development process on the first and second organic material layers as recited [this is inherent in the "photolithographic process" *Jang* discloses in col. 8, lines 33-34, for instance], so claims 12 and 19 are also anticipated.

Considering the additional limitations of claim 21, *Jang* also discloses an inorganic material layer [124] covering the entire surface of the substrate including the gate line, the data line, and the TFT, so claim 21 is also anticipated.

The first and second organic material layers are formed from a photosensitive material, so claim 2 is also anticipated. There is an inorganic material layer [124] covering the gate line, the data line, and the TFT, so claims 4 and 14 are also anticipated. The inorganic material layer is formed of one of silicon nitride and silicon oxide [col. 8, line 28] so claims 5 and 15 are also anticipated. The TFT comprises a

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gate electrode [102], an active layer [112], and source and drain electrodes [116, 118], so claim 7 is also anticipated. The uneven patterns have a height equal to or less than the second cell gap [see Fig. 13, and note that this is true regardless of whether the figure is drawn to scale], so claims 11 and 20 are also anticipated.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 7, 10-13, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fujimori et al.*, U.S. Patent No. 6,850,298 in view of *Kubo et al.*, U.S. Patent No. 6,195,140.

*Fujimori* discloses [see Fig. 24, for instance] a transfective LCD comprising a substrate [10] having a reflective portion [R] and a transmissive portion [T], a gate line [11], a data line [12], a thin film transistor [30], a plurality of uneven patterns [on 18] within the reflective portion, partially covering the substrate, and having an open portion at the transmissive portion, a reflective layer [24] on the uneven portions having a transmissive hole at the open portion [see Fig. 24], and a pixel electrode [22] on the reflective layer.

*Fujimori* does not explicitly disclose that the plurality of uneven patterns consist of a first organic material layer and that there is a second organic material layer on the

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first organic material layer. *Fujimori* appears to be silent on how the insulating layer 18 is formed, what it is made of, and how the uneven patterns are made.

*Kubo* discloses [see Figs. 43 and 44, for instance] an analogous LCD in which an uneven patterns are formed under the reflective electrode in order to provide a diffusively scattering reflective surface. *Kubo* discloses that this consists of a first organic material layer [253a,b made of the organic material layer 252] and that there is a second organic material layer [254] on the first organic material layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to form the bumpy surface in this way, motivated by *Kubo*'s teaching that these two layers form a diffusive reflector with very little flat surface, so specular reflection is minimized and a good quality reflector is obtained [see Figs. 20-24 and discussion thereof, and col. 37, lines 9-12]. Claim 1 is therefore unpatentable.

Considering the additional limitations of claim 10, *Fujimori* also discloses a common electrode on an inner surface of a second substrate, with liquid crystal between the pixel electrode and the common electrode, where in the pixel electrode and the common electrode are separated by a first cell gap [Td] in the transmissive portion, and a second cell gap [Rd] in the reflective portion, and the first cell gap is twice greater than the second cell gap [col. 26, lines 10-14, for instance]. Claim 10 is therefore anticipated as well.

Considering the additional limitations of claim 12, *Fujimori* in view of *Kubo* also discloses the method of fabricating the above LCD, comprising performing an exposure and development process on the first and second organic material layers as recited [this

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is shown in Fig. 20 of *Kubo*, and see discussion thereof, and the second layer must be patterned to be absent in the transmissive region as shown in *Fujimori* and in *Kubo*], so claims 12 and 19 are also anticipated.

In the embodiment discussed above, *Kubo* discloses that the first organic film [253] is formed from a photosensitive material, but does not explicitly state that the second organic layer [254] is also formed from the photosensitive material or that the material comprises a photo-acrylic resin. However, the second organic layer [254] is clearly patterned [see Fig. 44E], and it would have been obvious to one of ordinary skill in the art at the time of the invention to do so using a photosensitive material, motivated by the use of photolithography to pattern being reliable, precise, and well-understood. Moreover, *Kubo* discloses repeatedly using an acrylic resin for such layers throughout the disclosure [though silent on the material in this particular embodiment], and teaches that such a photo-acrylic resin is beneficial because it allows very thin layers to be formed easily by the spin-on method [col. 39, lines 7-11, for instance]. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use such a photo-acrylic resin for the first and second organic layers in the above embodiment in *Kubo*. Claims 2 and 3 are therefore unpatentable.

As discussed above, forming the first and second photosensitive material layers of a photo-acrylic resin would have been obvious to one of ordinary skill in the art at the time of the invention, so claim 13 is also unpatentable.

The TFT comprises a gate electrode, an active layer, and source and drain electrodes, so claim 7 is also anticipated. The uneven patterns have a height equal to



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or less than the second cell gap [see Fig. 24, and note that this is true regardless of whether the figure is drawn to scale], so claims 11 (if it is actually intended to depend on claim 10) and 20 are also anticipated.

9. Claims 4, 5, 14, 15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fujimori et al.*, U.S. Patent No. 6,850,298 in view of *Kubo et al.*, U.S. Patent No. 6,195,140 as applied above, and further in view of *You*, U.S. Patent No. 7,023,508.

*Fujimori* in view of *Kubo* does not disclose an inorganic material layer covering the gate line, the data line, and the thin film transistor. *You* discloses an analogous device [see Fig. 3, for instance], which has an inorganic material layer [116] made of silicon nitride, covering the gate line, the data line, and the thin film transistor. It would have been obvious to one of ordinary skill in the art at the time of the invention to use such *You's* inorganic silicon nitride layer in the above device, motivated by *You's* teaching that this maintains the reliability of the transistor and pads and enhances the strength of COG bonding [col. 9, lines 1-8]. Claims 4, 5, 14, and 15 are therefore unpatentable.

The additional limitation of claim 21 which has not already been addressed is that the uneven patterns cover portions of the inorganic material layer within the reflective portion excluding a peripheral portion of the pixel region. As can be seen from *Kubo's* figures, the uneven portions do not extend to the edge of the pixel region, so there is a peripheral portion excluded from the uneven patterns, as recited. Claim 21 is therefore unpatentable.

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10. Claims 8, 9, 11, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fujimori et al.*, U.S. Patent No. 6,850,298 in view of *Kubo et al.*, U.S. Patent No. 6,195,140 as applied above, in view of official notice.

*Kubo* does not explicitly disclose gate pads, data pads, or a capacitor electrode overlapping the gate line. The examiner takes official notice that these features are well-known and conventional in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to include them in the device of *Kubo*, motivated by the desire to make electrical contact to the gate and data lines, and to provide a reliable storage capacitance to improve the display quality. Claims 8 and 17 are therefore unpatentable.

Similarly, to make electrical contact to these, it is necessary to have drain contact holes, capacitor contact holes, gate pad contact holes, and data pad contact holes as recited; the examiner takes official notice that such are well-known and would have been obvious to one of ordinary skill in the art at the time of the invention, for the purpose of making electrical contact to the relevant electrodes through the second organic material layer. Claims 9 and 18 are therefore unpatentable.

The uneven patterns in *Fujimori* have a height equal to or less than the second cell gap [see Fig. 24, and note that this is true regardless of whether the figure is drawn to scale], so claim 11 (assuming it is intended to depend from claim 9) is also unpatentable.

**Conclusion**

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,697,138 to *Ha et al.* discloses a transflective LCD with the pixel electrode on the reflective layer [see Fig. 7], but the second organic material layer [191] does not have an open portion at the transmissive portion.

U.S. Patent No. 6,765,637 to *Takenaka* discloses a transflective LCD with the pixel electrode on the reflective layer [see Fig. 12], but the second organic material layer [7a] does not have an open portion at the transmissive portion.

U.S. Patent No. 6,809,785 to *Fujino* discloses a transflective LCD with the pixel electrode on the reflective layer [see Fig. 3], but the bumpy layer underneath the reflective electrode is inorganic rather than two organic layers; in the related art Fig. 12, there are organic layers but the reflective electrode is on the pixel electrode.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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8 May 2007